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COMMONWEALTH PHYTOPATHOLOGICAL NEWS

A QUARTERLY REVIEW OF NEWS AND VIEWS ISSUED BY THE COMMONWEALTH MYCOLOGICAL INSTITUTE, KEW, SURREY

MAIN ITEMS

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EDITORIAL

For a number of years plant pathologists in Commonwealth territories have felt the need of a broadsheet giving up-to-date information on developments in plant pathology throughout the Commonwealth. This was particularly so in the Colonial Dependencies where plant pathologists are few and often very isolated. At the Fourth Commonwealth Mycological Conference in London in 1948 the subject was brought up by Mr. N. F. Robertson (then at the West African Cocoa Research Institute) with the result that a resolution in the following terms was unanimously adopted by the Conference: "The Conference would welcome the issue, by the Commonwealth Mycological Institute, of a broadsheet of items of mycological and phytopathological interest contributed by Commonwealth workers." The proposal was endorsed by the Commonwealth Agricultural Bureaux Review Conference in 1950 and some financial provision was made for it during the years 1952-7. Lack of accommodation and lack of staff have prevented the proposal being implemented until now. This first issue of the new periodical represents a small start but it is hoped that it will grow in size and usefulness as the years go by. It is being issued quarterly but publication could be at more frequent intervals if justified. In the work of editing I am happy to have the assistance of Dr. J. C. F. Hopkins, who joined the Institute staff about six months ago, after serving as Plant Pathologist to the Government of Southern Rhodesia for 27 years. So far the response to an appeal for matter to publish has been good, so good in fact that some has had to be held over to the next issue. The success of the venture will largely depend on material received, and the co-operation of all Commonwealth plant pathologists and mycologists is sought in supplying suitable matter.

S. P. Wiltshire

ADVANCED COURSE IN PLANT PATHOLOGY FOR RESEARCH STUDENTS, CAMBRIDGE

An interesting circular has been received from S.D. Garrett outlining an advanced course in plant pathology for research students at the Botany School, Cambridge, which it is proposed to inaugurate in this academic year. It is aimed at providing the student with additional specialised knowledge which he would not normally acquire when following the course of the Natural Sciences Tripos in botany. The latter is designed, in the words of the circular, "to produce good all-round botanists (and biologists) rather than half-fledged specialists", in the belief that students so trained "will eventually surpass as plant pathologists some others that have received more technical instruction in plant pathology at the expense of a good general education in all branches of botany".

The scope of the new course as outlined in the memorandum is wide, covering both fundamental principles as well as practical details. The teaching is in the hands of staff who themselves have practical knowledge of the difficulties confronting a newly appointed plant pathologist, especially in the tropics, and their guidance should endow him with that confidence and ability which knowledge alone can provide. Dr. Garrett will have the assistance of N.F. Robertson and J. Risbeth in this task.

The syllabus is designed to cover Taxonomy and Variation of Fungi, especially including practice in identification of species (Michaelmas term); methods of investigating plant diseases, including root-infecting fungi and root disease control (Lent term); and weekly excursions during the long vacation to see diseases of crops in the field.

There is no doubt that additional facilities for training plant pathologists in the practical application of their science are sorely needed in the United Kingdom, and it is to be hoped that the new course will be suitably supported, not only by students eager to attain efficiency, but also by the establishment of more posts for plant pathologists in those territories of the Commonwealth whose augmented economic development is at present hindered by serious crop losses caused by plant diseases.

JUBILEE CONFERENCE OF THE ASSOCIATION OF APPLIED BIOLOGISTS

A Jubilee Conference to celebrate the fiftieth anniversary of the founding of The Association of Applied Biologists was held at Imperial College, London, during 13th-15th September, 1954. The Registrations for the Conference numbered 430 and included 62 from countries outside the United Kingdom.

The opening ceremony was held in the Imperial Institute; the President of the Association, Professor W. Brown, read messages which had been sent to Her Majesty the Queen, Professor W. Brierley and Mr. Cecil Warburton, who was the only surviving original member of the Association and who recently celebrated his hundredth birthday. After giving a brief history of the Association the President welcomed members and their guests and visitors. Dr. E. Gram (Denmark) and Dr. K. Starr Chester (U.S.A.) replied on behalf of visitors from Europe and North America.

The inaugural address of the Conference was given by Sir John Russell who spoke on "The Changing Problems of Applied Biology". Evening lectures were given on each day; in the first Professor E.C. Stakman (University of Minnesota) took as his subject "Progress and Problems in Plant Pathology". Professor V.B. Wigglesworth (University of Cambridge) gave the second lecture on "The Contribution of Fundamental Research to Applied Biology" and in the last Dr. K.W. Neatby (Director, Science Service, Canada) described "The

Application of Biological Research to Canadian Agriculture and Forestry".

The remaining papers presented at the Conference were grouped into ten symposia in which thirty-four papers were read; nine of these were given by visitors from Europe or North America. The following topics were the subjects discussed; international co-operation, education and extension services, virus diseases, soil-borne pests and pathogens, insect pests of stored products, zoological problems, nematology, crop protection, forecasting and assessment of plant diseases and plant growth-regulating substances.

Some two hundred members were received by the President at a Reception held on the evening of 13th September, and on the 14th over five hundred members and visitors attended a Conversazione, which was held in the Main Chemistry Laboratories of Imperial College. The ninety-five exhibits were grouped into the following twelve sections: growth and soil investigations, plant breeding and crop improvement, methods in applied biology, medical and veterinary zoology, agricultural zoology, forest entomology, pests of stored products and of timber, horticultural and agricultural entomology, plant pathology and virology, helminthology, chemical methods of plant and animal protection and apparatus. This was described by the Institute of Biology as the largest collection of biological exhibits shown in the U.K. in recent years.

A Dinner was held in the Imperial College Refectory on the evening of 15th, being attended by some 150 members and distinguished visitors.

The Conference was followed by a series of visits to Research Stations on 16th and 17th.

The Proceedings of the Conference and a list of those who attended will be published as a separate Volume of the Annals of Applied Biology; this is expected to be available by April, 1955, and will be obtainable by non-members of the Association from the Cambridge University Press.

R.K.S.W.

Thinking in Print

One of the reasons advanced by its protagonists for a broadsheet on phytopathological matters was to provide a forum where pathologists, mycologists, and others dealing with cognate subjects could, as it were, think in print and exchange ideas from one end of the Commonwealth to the other.

Most of us at some time or other have experienced the sense of frustration brought about by isolation and the inability to expound our views, or criticise those of others, without the necessity of framing our opinions within the rigid confines of a formal scientific paper.

It is in an endeavour to dispel this sense of frustration and to encourage informal discussion among plant pathologists and mycologists in general that the Editor offers space in the Commonwealth Phytopathological News for opinions, observations, queries, and anecdotes which would be of interest to colleagues elsewhere.

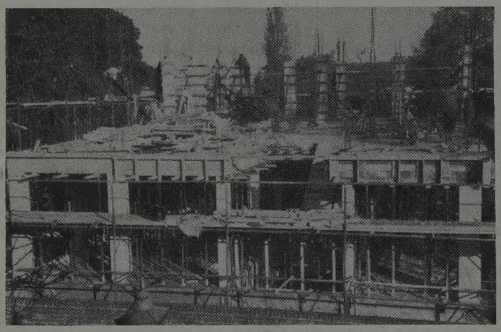
Particularly welcomed would be short notes of phytopathological interest such as unusual facets of a disease, a description of some new gadget or piece of machinery (especially if locally made), a short note on a conference (with group photos if possible), the erection or formal opening of new laboratories, and so on.

We, for our part, will try to keep you in touch with the happenings in the U.K. so that by our combined efforts the lone plant pathologist may be made to feel not only less lonely but that he, together with colleagues throughout the Commonwealth, is part of a team raising the status of plant pathology as a science throughout the world.

J.C.F.H.

The New C. M. I. Building

Delegates to the Commonwealth Mycological Conference held in London last July were able to see the initial stages of construction of the new C. M. I. building being erected on the other side of Ferry Lane. The wet summer placed numerous obstacles in the way of the contractors, and the amount of water pumped from the excavations for the foundations had to be seen to be believed. Happily those days are now past and the original concrete work has been lined and made



The new building as seen from the first floor of the present Institute.

damp-proof with a substantial layer of bitumen.

Since then the building has shot skywards, so that the panorama of Kew Bridge as seen from Dr. Bisby's laboratory has now disappeared from view permanently — not just temporarily as commonly occurs at this time of the year! Vast masses of steel struts and concrete columns enclose the future Herbarium and should lend confidence to the bungalow-bred visitors from the tropics who will be accommodated on the top floor.

Greatly enlarged library space will be a specially welcome feature of

The ground and first floors with supporting columns as seen from the river towpath.

the building, so that the full wealth of literature will be at hand for consultation and not stacked two or three rows deep on the shelves, as has been their unwonted fate for so long in the restricted space of the old room.

(To be continued)

INTERNATIONAL CO-OPERATION IN THE PRODUCTION OF RUST RESISTANT CEREALS

Co-operation in the Commonwealth

by T. Johnson, Winnipeg

Co-operation between Commonwealth countries in the production of rust resistant cereals has been of an informal nature but has nevertheless been of the highest practical importance. Of particular significance was the production in Kenya Colony, prior to 1930, of a number of varieties of common wheat with a high degree of resistance to black stem rust, Puccinia graminis f. sp. tritici. Several of these varieties were received in Australia in 1930 and in Canada in 1934 and some of them showed high stem-rust resistance in both countries. One of these, Kenya C6040, was used in Australia as early as 1931, in crosses that resulted in the production of the rust-resistant variety Eureka. Some of the Kenya wheats have also entered into the production in Australia of more recently developed rust-resistant wheat varieties such as Charter, Yalta, and Kendee. For the period 1932 to 1939 Canadian and Australian plant breeders grew F1 populations of their crosses for each other every year, a programme which was interrupted by the war. Notes were also taken on the rust reaction of the hybrids and seed of certain promising lines was increased.

The appearance in North America of wheat stem rust race 15B brought the Kenya wheats into prominence as sources of stem rust-resistance. Soon after the discovery of this race, about 1940, it was realized that if it became widely distributed all the rust-resistant wheats produced between 1930 and 1940 would be liable to rust damage. Extensive search for new sources of resistance revealed that certain of the Kenya wheats were resistant to this race and to the various other stem rust races prevalent in North America. Accordingly, several Kenya wheats, particularly K. 58. F (L), K. 117 A, and K 338 AC. 2. E. 2, have been widely used in breeding for stem rust-resistance in Canada, the United States, and Mexico.

As stated above the co-operation that has taken place thus far between Commonwealth countries has been purely informal, based largely on correspondence between workers in the various countries, which has led to a free exchange of varieties and new hybrid material. Occasional visits, such as those of Mr. J. G. L. Burton, of Kenya, in 1930, and Dr. S. L. Macindoe, of Australia, in 1930 and 1939, to Winnipeg, Manitoba, were a great stimulus both to the exchange of material and to the development of a mutual understanding of the problems confronting different Commonwealth countries, and the methods used in solving them.

The contribution of Kenya Colony has been emphasized because of its great importance to breeding against rust in Australia and North America. Nevertheless, the exchanges that have taken place have by no means been unilateral because both Australia and Canada have made liberal contributions of wheat varieties to each other and to Kenya; in fact, both Canadian and Australian wheats have entered into the making of several of the Kenya varieties, and some Canadian wheats, for example Regent, have served for a period as rust-resistant wheats in Kenya Colony. Co-operation has not been confined to wheat breeding. For many years it has been the practice of the Rust Research Laboratory at Winnipeg to supply plant breeders in Kenya and the United Kingdom with the rust-resistant oat varieties produced by Mr. J. N. Welsh, for tests of their performance in these countries.

Even if the advantages of placing the informal co-operation of past years on a more formal basis at the present time are debatable there can be no doubt of the benefits to be derived from inter-Commonwealth visits of the workers

concerned with the production of rust-resistant cereals. Such visits would be of particular benefit if some of the younger workers, with many years of productivity ahead of them, are permitted to study the problems and procedures employed in other Commonwealth countries.

Co-operation in the Americas

The rust problem is common to the United States and Canada. Stem rust of wheat, leaf rust of wheat, and other rusts of cereals survive the winter in Texas and from this over-wintering centre they work their way northwards every summer into the spring wheat area which extends from Nebraska northwards into Manitoba and Saskatchewan, in Canada. The extensive damage caused to spring wheat by leaf rust and stem rust led to the first effective control measures for these diseases in North America. In this connection the studies by Dr. E.C. Stakman, of the University of Minnesota, and of Dr. H.K. Hayes, of the same institution, are of outstanding importance. Dr. Stakman showed that wheat stem rust is made up of a large number of pathogenic strains — the so-called physiologic races. Dr. Hayes was among the first to produce by hybridization varieties of common wheat that were resistant to rust. From 1915 onwards many Canadians studied with these men and carried their ideas and techniques to Canada. At first, co-operation relative to rust was largely on an informal basis but it was, nevertheless, co-operation based on exchange of information and ideas.

With the production of rust-resistant bread wheats in both the United States and Canada in the mid-thirties the rust problem appeared to be solved for a number of years, and stem rust was no longer a problem during the period 1939-49. With the outbreak of a new virulent race of stem rust in 1950 this situation was radically changed. Wheat varieties that had been resistant to rust for more than a decade were suddenly susceptible. The gravity of this new situation called for the fullest utilization of existing knowledge and a general, co-ordinated plan of rust investigation. To achieve these ends a conference was held at St. Paul, Minnesota, in November, 1950, attended by American, Canadian, and Mexican rust investigators and by plant breeders concerned with wheat breeding. At this conference a movement was set under way to replace the sporadic, informal co-operation of former years by carefully planned co-operation aimed at specific objectives. As a result there is now prompt exchange of information concerning rust development and the movement of air-borne rust spores. The identification of the physiologic races of stem rust and leaf rust is carried out in both Canada and the United States, and information on the distribution of races is promptly circulated to the various workers in mimeographed form. Particularly elaborate co-operation has been set up on the testing of large numbers of wheat varieties against rust in the field and against specific physiologic races in the laboratory, and information on all such tests is passed along promptly to the various investigators. All three countries — the United States, Canada, and Mexico — co-operate in the "screening" of the World Collection of wheats comprising more than 12,000 varieties, which is maintained at Beltsville, Maryland. The object of this screening is to determine the reaction to rust of the wheat varieties that are known to exist so as not to overlook any possible sources of resistance to these rusts. In addition to this there is, of course, extensive testing in all three countries of the rust resistant hybrid wheats that are being produced by the various wheat breeders working in North America and elsewhere. The most promising hybrid material is freely made available to all plant breeders co-operating in this work.

Special mention may be made of the assistance given by American agencies to Canadian wheat breeders in the rapid increase of new Canadian hybrid wheats. To increase these as rapidly as possible a crop is grown in Canada in the summer and, after harvest, the seed is planted in southern California for increase during the winter. This crop is harvested in the spring in time for planting again in Canada.

At present arrangements are being made for the growing and testing of

Canadian and American hybrid wheats in Mexico in a "Winter Nursery" where they will be subjected to severe rust epidemics, which should eliminate rust-susceptible hybrids and permit rapid selection and multiplication of those that are most rust resistant.

The results obtained in these various lines of investigation are assessed periodically at international conferences. It has been referred to above that the first such conference was held at St. Paul, Minnesota, in November, 1950. The second conference was held at Winnipeg, Manitoba, in January, 1953. A third conference will probably be held in Mexico City in October, 1955.

When a variety is found suitable for distribution in either Canada or the United States it has been the practice to release a certain amount of seed for distribution in the other country. Examples are the release of a quantity of seed of the American variety Thatcher to Canada in 1935 and the distribution of seed of the new Canadian variety Selkirk to the United States in 1954.

Finally it should be mentioned that the co-operation briefly discussed above is not limited to Canada, the United States, and Mexico although they play the major part in it. Since 1951, several South American countries have made considerable contributions to this work.

FIJI DISEASE OF SUGAR-CANE IN MADAGÁSCAR

by G. Orian

On April 27th last Fiji disease of sugar-cane was discovered by Mr. H. Barat, Director of the Laboratoire de Pathologie Végétale of the Services de l'Agriculture, during an inspection at Ambodiatafa in the Brickaville district on the East Coast of Madagascar.

Soon afterwards a second centre of heavy infection was discovered at Anivorano in the same district, the remainder of which was found to be infected

Badly affected patch of 134/32 in a "betsabetsa" field

at numerous places although to a much lesser degree than at Anivorano and Ambodiatafa. Another severe outbreak was detected at Fénérive, a cane-growing area two hundred kilometres away from Brickaville and isolated foci of infection were also discovered in the Tamatave area, about midway between Brickaville and Fénérive.

After the discovery of the disease the writer proceeded to Madagascar in order to assess the extent of spread and the precautions which might be necessary for the protection of Mauritius.

The incidence of the disease in the various affected regions seemed to indicate that it was introduced into Madagascar some time during the past ten years. How it was imported will very likely remain a mystery, but if it be remembered that an outbreak of mosaic disease was also detected in the same area in 1952, it seems clear that unauthorized introductions of sugar-cane have taken place in the recent past. Fiji disease has not yet been detected on the West Coast of Madagascar where numerous sugar-cane plantations exist.

It would appear that Fiji disease remained in an incipient stage for some time in the Brickaville area, for it was not observed by Mr. Barat on a rapid tour of the region in 1952. In the space of a few years it has been spreading at an alarming speed following the extensive propagation of the Mauritius cane 134/32, which has proved very susceptible to it although resistant to mosaic and leaf scald. Fiji disease has also been encountered on the Louzier variety, on P.O.J. 2878 and on Batavia. The Mauritius cane, Ebene 1/37, still in propagation plots at some places, has also already shown indications of being very susceptible.

The fight against Fiji disease in Madagascar will be costly and very difficult for the chief variety grown by sugar estates on the East Coast is the very susceptible M. 134/32, and Perkinsiella saccharicida Kirk., the principal vector of the disease, is present in Madagascar. Unless sources of absolutely clean seed are established during the period that other methods of control are being applied M. 134/32 will have to be replaced by varieties resistant to the disease.

Furthermore, sugar-cane is commonly grown for eating purposes by the natives, and small garden plots or a few stools of the plant about the huts constitute a common feature of every village in that country. Even isolated huts in the forests generally have a few cane stools in their vicinity, the sugar-cane occasionally grows completely wild on old sites of abandoned habitations in the jungle.

Again, besides the regular plantings by sugar estates and distilleries, there exists along the East Coast of Madagascar a very large number of widely scattered small plots of about two hectares each in which a mixture of old cane varieties are grown for making betsabetsa, the name given locally to cane juice expressed by small mills of the laboratory type. It is sold to the natives fresh or fermented, apparently at enormous profit,the area under cane for this purpose being some two hundred hectares.

After planting this cane is allowed to grow for up to fifteen or more years, practically without cultivation. In consequence a mat of decaying straw, lodged sticks, and rank vegetation,chiefly twiners, turn the plots into a jungle, at times nearly impenetrable. If the production of betsabetsa must be allowed to continue it would be necessary, in order to control Fiji disease, for the cultivation of such fields to be modernized and resistant varieites grown.

These facts are intended to show how difficult will be the work of eradicating Fiji disease from Madagascar.

Change of Address

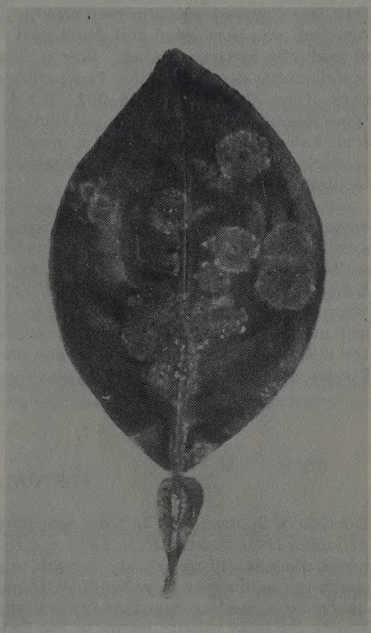
The Directorate of Plant Protection, Quarantine, and Storage of the Ministry of Food and Agriculture of the Government of India has removed from Block No. 9 on Shalijehan Road Hutments to newly built 'ManSingh Road Hutments', New Delhi, India. All communications for the Plant Protection Advisor should be sent to the new address.

CONCENTRIC RING BLOTCH OF CITRUS IN NIGERIA

by S. R. Chant

Concentric Ring Blotch of citrus has been recorded recently in Ibadan Province, Nigeria, for the first time although it has already been observed in Kenya, Portuguese East Africa, Northern and Southern Rhodesia. This appears to be the first record for West Africa.

The disease is most commonly found on unselected sweet orange seedlings grown as rootstocks for budding local sweet orange selections; it is not known for how long it may have been present in a citrus nursery at Moor Plantation. When first noticed in February 1954 it was so severe as to cause partial defoliation of the seedlings. The major effect is a weakening of the plant due to loss of effective leaf area. There is considerable varietal and inter-varietal variation in the symptoms. In Nigeria they have never been observed by the writer on plants of more than four years of age.



Concentric ring blotch on sweet orange

On the sweet orange seedlings the first symptoms appear in the form of small light green spots or flecks on the young leaves and twigs. The spots increase in size and finally exhibit a more or less concentric zoning with gummy excrescences distributed over the zonations. The blotches are roughly circular in shape, but often with an irregular outline. There is considerable variation in size of mature blotches depending on their density on a particular leaf, the diameter range being of the order of $\frac{1}{4}$-$1\frac{1}{4}$ inches. These symptoms correspond to those described in South Africa and Dr. A. P. D. McClean, of the Union of South Africa Department of Agriculture, has confirmed them as being typical of concentric ring blotch.

An additional feature on some affected leaves is yellow flecking on and between the secondary veins, but as this symptom is not included in the South African description it may not be caused by ring blotch.

Microscopic examination of leaf sections shows that the palisade cells contain granular matter, but there is no sign of a pathogenic organism in the tissues.

Attempted transmissions by budding and inoculation of mechanically bruised healthy leaves with macerated tissue and bacteria obtained from culture of affected leaves have so far proved unsuccessful.

It is suspected in South Africa that soil and climate are the chief factors in producing ring blotch, but there is little doubt that age of the tree is also an important factor. In the Moor Plantation nursery the incidence of the disease has markedly decreased on seedlings which have reached the age of eighteen months.

The writer wishes to express his thanks for the advice and assistance he has received from the Director of the Commonwealth Mycological Institute and his staff, particularly J. C. F. Hopkins. Grateful acknowledgment is also due to Dr. A. P. D. McClean, Department of Agriculture, Union of South Africa, who has identified material and provided comments and other valuable information.

NOTES FROM CANADA

Phytophthora cactorum Leb. & Cohn caused an unprecedented outbreak of rot in Kieffer pears this fall at St. Catharines, Ontario, resulting in a 15 to 20 per cent. loss of crop. The fruit had been harvested into containers in the orchard where they were exposed to splashing and flooding by heavy rains before they were moved into common store. The rot appeared about three weeks after the crop was harvested and developed rapidly as the fruit reached a desirable stage of maturity for processing. Warm days and cool nights during the storage period favoured rot development. The pathogen was first reported in Canada by Gussow (Agr. Gaz. Canada, 6: 951-952, 1919), who found it in decay in pear fruits received from Kentville, Nova Scotia. Although the pathogen is of little importance as a fruit rot in Canada, it causes a most destructive crown rot of fruit trees, particularly of apple, in the irrigated orchards of the Okanagan Valley, British Columbia.

Under the potato breeding programme centred at Fredericton, New Brunswick, a concerted effort is being made to keep nucleus stocks of the most promising seedlings free from virus X. These stocks are grown each year in isolated plots at the sub-station at Alma. Those stocks that were found to be free from virus X by the serological method in 1953 in a mass test were mutliplied at Alma. This year the plants were not subjected to the serological test as this method proves at times to be only 80 per cent. accurate under field conditions. Instead juice from the individual stocks under test was used to inoculate the sensitive indicator plants, Datura stramonium var. tatula and Gomphrena globosa.

L.C. Conners

AUSTRALIAN NOTES

Decline of Spotted Wilt in New South Wales — This virus disease, which was first reported from Australia in 1918 and for many years was one of the most troublesome diseases of tomatoes, lettuce, and many other plants, has failed to be of much importance in New South Wales again this season, for the sixth season in succession, and no satisfactory explanation for the decline has been put forward. Formerly field tomato crops in the Sydney Metropolitan and surrounding districts had suffered heavy losses by early November but again this year barely a trace of the disease has been seen. Entomologists of the New South Wales Department of Agriculture have not noted any pronounced drop in the population of Thrips tabaci, which has been accepted as the most important vector in carrying the virus from weeds and perennial ornamental plants.

The first advance in controlling the disease in tomatoes in New South Wales was the introduction about 1943 of the use of tartar emetic and sugar, sprayed on to plants once a week as a bait for migrating thrips. Later the use of tartar emetic was superceded by sprays of DDT emulsion. It is unlikely, however, that the introduction of DDT can be given the credit for the decline since spotted wilt in recent years has ceased also to be an important disease of lettuce, broad bean, and sweet pea, which normally do not receive DDT sprays. Everyone in New South Wales is very happy about the "fall" of the disease except plant pathologists, who feel in some way cheated by it.

C.J. Magee

NEW ZEALAND NOTES

New Diseases — Barley loose smut (Ustilago tritici) which had been completely eliminated from malting barley crops in New Zealand by hot water treatment for over twenty years, was found last season in some crops. The infection is thought to have originated in feed barley which is not hot water treated.

Violet root-rot (Helicobasidium purpureum) of carrots and mangolds, al-

though found in New Zealand over 40 years ago had not subsequently been seen until the 1953 season when it caused losses in several crops.

Take-all disease which is widespread in wheat crops was identified in oat crops growing in Southland last season. It is not likely to become serious as oats are not grown frequently in the rotation in New Zealand. The identity of the causal fungus will be checked if further samples are collected this year.

Crown-wart (Urophylyctis alfalfae) and Stagonospora root-rot (Stagonospora meliloti) are two newly recorded diseases of lucerne. The former has been found only on the Crop Research farm, but the latter disease is widespread in Canterbury and Otago causing serious losses through poor recovery and death of plants.

Anthracnose (Glomerella cingulata) of lupins has caused serious losses in crops grown for seed in Canterbury. Some crops have been complete failures for seed purposes, but there is a possibility that resistance to this disease may be found in some varieties.

Cereal yellow-dwarf, an aphid-transmitted virus disease of wheat, oats, and barley was found to be very widespread last season and already this season has been found in many wheat crops. The virus is apparently spread by aphids overwintering on roadside grasses. Bromus spp. in particular are susceptible to this virus.

Blast of stone fruit (Pseudomonas syringae) which has become a serious problem in the establishment of new orchards has been effectively controlled by the antibiotic streptomycin sulphate in recent glasshouse experiments at Auckland by D.W. Dye and M.H. Dye.

Massey College (University of New Zealand) — Mr. H. Wenham, lecturer in microbiology has recently returned from one year at the Plant Pathology Depaetment, University of Wisconsin, U.S.A.

H.C. Smith

NOTES FROM INDIA

Stunting of sugar-cane — A new disease has come to light recently, characterised by arrested plant growth and production of a large number of thin, small, grassy shoots, giving the plant a bushy appearance. It is reported to be serious in certain parts of Bombay State affecting Co. 419, particularly the ratoon crop, and appears to be of virus origin.

Cereal rusts — At the Indian Agricultural Research Institute, two new races, one of black rust (Puccinia graminis tritici) and the other of brown rust (Puccinia triticina) have been picked up. The former has been isolated from Kenphad 28 collected at Coimbatore and is closely allied to race 72; it has been provisionally designated as race C. The latter was isolated from a sample collected at Pusa, Bihar. It differs from other Indian physiologic races of brown rust in producing Type-4 infection on the differential Mediterranean, which has so far been resistant to all the eight known Indian races.

Puccinia graminis tritici has infected Vulpia myuros, a common wild grass from the Nilgiris, in the glass house where plants were incubated for 72 hours in the humid chamber after inoculation.

Alternaria leafspot of wheat — It is reported from Bombay that some of the new improved wheat varieties produced by the State Department of Agriculture were heavily damaged by Alternaria leafspot, while N.P. 710 and N.P. 715, the improved vulgare wheats bred at the Indian Agricultural Research Institute, remained tolerant and maintained their high yield.

Guava decline — A serious disease of guava (Psidium guajava), which is of widespread occurrence in Pushkar valley of Ajmer-Merwara, was observed to take a heavy toll of certain orchards, resulting in crop losses to the extent that cultivators were abandoning guava cultivation. The disease is characterised by stunting of the affected shoots, extreme reduction in leaf size, and defoliation. Leaves of the affected plants are leathery and occasionally show interveinal yellowing and green vein-banding. Few or no flowers develop on diseased shoots and the fruits borne on these shoots crack and dry up. It is thought to be due to zinc deficiency.

Potato wart (Synchytrium endobioticum). The occurrence of this disease was reported for the first time in India by Ganguly and Paul (Sci. & Cult., 18: 605, 1953). It appears to have been introduced with seed potatoes received from Holland by a private grower, and grown in Darjeeling district of West Bengal where conditions for the establishment of potato wart are favourable. Prompt action was taken by the authorities in destroying the affected crop. The disease has not since been reported from any locality.

R.S. Vasudeva

PERSONAL NEWS

Visitors at C.M.I.

Mr. Syed Bazley Ali, by arrangement with the Government of Pakistan, spent several weeks in October and November studying herbarium methods at the Institute.

Dr. C.G. Hansford, of the Waite Institute, Adelaide, Australia, but perhaps better known to mycologists by his association with Uganda, is using the C.M.I. as a centre for his studies of the micro-fungi of Australia incorporated in Cooke's 1892 Handbook, and in preparing a monograph of the Meliolineae. He expects to remain in England until May of this year.

Appointments, Transfers, and Retirements

The following appointments have been made in the Colonial Agricultural Service: A.J. Spence, Plant Pathologist, Trinidad; W.P. Mowat, Plant Pathologist, Tanganyika (Probationary scholarship).

B.E.J. Wheeler has been appointed to the Colonial Office "pool" of plant pathologists at the C.M.I.

G.B. Wallace, Plant Pathologist, Tanganyika Territory and his wife, Maud Wallace, will be retiring from the Colonial Agricultural Service in April. They expect to return with their family to Scotland.

F.C. Deighton, Plant Pathologist, Sierra Leone, will be retiring in April and is returning to England.

Our Correspondents

Dr. H.C. Smith, of the Plant Diseases Division, Department of Scientific and Industrial Research, Auckland, New Zealand, has been appointed as New Zealand Correspondent for this newsletter, whilst headquarters of Botany and Plant Pathology Division, Ottawa, have undertaken the task for Canada.

New Zealand Notes

Dr. E.E. Chamberlain returned to New Zealand in November after several months in the United Kingdom where he visited research stations and attended the Commonwealth Mycological Conference.

Dr. R.E.F. Matthews is continuing his work in chemotherapy of virus diseases at the Molteno Institute, Cambridge, for a further year.

Mr. I.A.M. Cruickshank, who has worked at the Low Temperature Research Station, Cambridge, during the tenure of a Nuffield Fellowship, is also now on his way back to New Zealand. He will return to the Plant Diseases Division sub-station at Crop Research Division, where he will follow up his recent work on the biochemistry of disease resistance.

OBITUARY

It is with great regret that we have to record the death of Professor R.E.D. Baker, Professor of Botany and Plant Pathology at the Imperial College of Tropical Agriculture, Trinidad, since 1949. He was head of the Department of Mycology from 1937, and awarded the Chair of Mycology in 1945.

As we go to Press news has been received of the death of Dr. John Dearness of Canada, aged 102½.

NOTES FROM TANGANYIKA

The local disease which has perhaps had more attention than any other in the past few years is the Panama disease of bananas. It has been found that the control methods employed are practicable and within limits effective. If the quip that "the operation was successful but the patient died" is applicable in this case, the success has primarily been in retarding spread and preventing new outbreaks. So far very few varieties of banana have been found susceptible to the disease, and in endemic areas interest is being shown in the propagation of resistant varieties.

It is very unusual for a disease which has broken out in a country to be eliminated, but that would appear to have happened in the case of bacterial blight of peas and of a virus disease of sunflower. The former was found for the first time in Tanganyika in 1951, but as a result of drastic measures for its elimination and the wholehearted collaboration of planters of the crop no new case has been found in the past two seasons. It is likely that the production of pea seed for export could now be safely resumed. The virus disease of sunflower was a single outbreak in 1947. This was severe, reducing crop 30 per cent., but all affected plants were destroyed as they appeared, and no further case has since been found.

Another disease of which only a single outbreak has been recorded is scab of papaw. The parasite is a new species of Sphaceloma (identified by Jenkins and Bitancourt) and appeared in a field near Moshi in 1953. The weather in 1954 was dry, and that circumstance together with the measures taken to reduce humidity among the trees is thought to account for its non-recurrence.

Three bacterial diseases recently observed in the Territory for the first time occurred on candytuft, larkspur, and schizanthus. They were identified by Dr. W. J. Dowson, Cambridge.

The candytuft organism is Xanthomonas campestris var. armoraciae (McCulloch) Starr & Burkholder, strain. In addition to fresh candytuft, other Cruciferae susceptible to inoculation were horse-radish, cauliflower, and cabbage. The larkspur organism is Bacterium carotovorum var. atrosepticum Hellmers & Dowson, the cause of black-leg in potato. The latter disease has not been seen in Tanganyika, but a culture of the larkspur organism decomposed tissue in tuber slices. The schizanthus parasite is B. carotovorum var. aroideae Hellmers & Dowson. The bacteria proved to be pathogenic to potato, tomato, tobacco, petunia, Capsicum annuum, Physalis peruviana, larkspur, and the indigenous weed Nicandra physaloides, in addition to schizanthus. Among thirteen garden plants not infected were groundnut and French bean.

Two diseases of coffee are proving increasingly destructive. These are rotting from cut surfaces after pruning or cutting back, and a disease which is being referred to as 'Scaly bark' with which Fusarium stilboides is associated. This species is very closely related to F. lateritium var. longum, the cause of bark disease of coffee. Scaly bark is still under investigation.

G. B. Wallace

GOLD COAST NOTES

After a hiatus of nearly two and a half years without a Plant Pathologist in the country, Mr. R. Leather arrived in August 1953 and was stationed at Keta to investigate the Cape St. Paul wilt of coconuts. In December 1953 Mr. E. B. Martyn arrived on a year's contract posting, to supervise investigation of the coconut disease and the virus disease of seedling limes and other citrus. A third Plant Pathologist, Mr. L. Piening, is expected in December 1954 so that for a brief period the Division will be up to its full strength of three.

Coconut disease—The coconut disease on the Keta coast appears to be similar to

the bronze leaf wilt in the Southern Caribbean. In October 1954 Mr. Martyn visited Nigeria where an apparently identical disease was found affecting scattered coconuts grown among village compounds. The disease was found chiefly around Awka, in Onitsha province, but other cases were noted at Asaba, in Benin province, and at Umuahia in Owerri province. The soil in these areas is a reddish, friable, porous sand to sandy clay of considerable depth, which rules out the possibility of a physical causal factor such as an impermeable subsoil, a high water table, or a quickly drying sand. In the absence of any evidence of a pathogen such factors have in the past been speculatively suggested as causes of the disease, but the trend of evidence suggests that the cause is nutritional, but may not be a simple lack of one minor element. More detailed investigation of the nutrient requirements of coconuts is considered to be the most promising line to adopt to discover the cause not only of diseases of the bronze leaf wilt type, but of several minor diseases of coconuts such as 'tapering' and the varied crown diseases observed in the British West Indies.

Virus disease of Citrus — Further investigation of the lime virus disease akin to the tristeza, quick decline, or stem pitting of other parts of the world has been carried out and contact made with American workers. It is apparent that the West Indian lime, which is susceptible on its own roots, cannot be effectively protected from the disease on any stock, and the same applies to grapefruit, though the latter does not succumb quite so rapidly. It has been observed that both 'vein flecking' and 'little leaf' associated with the disease in the Gold Coast can on occasion be found on limes in areas free of the disease (e.g. Nigeria). The presence of the disease, is, however, unmistakable when browning of the stem tissues, pitting and die-back also occur. Observations on leaf flecking and of abnormal functioning of the root system caused, when the disease is present, by the effect of the virus itself on the roots. This seems a more likely explanation than the concept of a number of different strains of the virus being responsible. Further investigation of this feature is to be carried out.

Coffee rust — Coffee rust, Hemileia vastatrix, was first observed in the Gold Coast (Trans-Volta-Togoland) in September 1953, and has since been found to be quite widespread near the border of French Togoland, whence it is presumed to have come.

R.D. Linton

ERADICATION OF PLANT DISEASES

One of the outstanding features of the Fifth Commonwealth Mycological Conference held recently in London was the discussion on the successful eradication of plant diseases from various countries, notably from Australia. The classic example of the eradication of citrus canker (Xanthomonas citri) from South Africa, the Northern Territory of Australia, and the Gulf States of America had shown what might be done in this direction but it was most impressive to hear at first hand the recent achievements in Queensland, New South Wales, Western Australia, and New Zealand.

A paper by C.G. Hughes (read by Dr. Magee) described in detail the methods adopted in Queensland against sugar-cane diseases, which have resulted in the complete eradication of gumming disease (Xanthomonas vasculorum) and downy mildew (Sclerospora sacchari), apart from an experimental plot kept for testing varieties for resistance to the latter disease; both were formerly major diseases in Queensland. Furthermore Fiji disease, which at one time threatened the whole sugar-cane industry, has been reduced to an incidence of only a few hundred infected stools a year and appears to be fast approaching extinction. Ratoon stunting (probably caused by a virus) and pineapple disease (Ceratocystis paradoxa) have not been eradicated yet, but control measures have been worked out and it should be only a mttaer of time before each disease ceases to cause trouble.

Dr. Magee gave an account full of interest of the campaign for the eradication of citrus canker from the Northern Territory of Australia lasting from

1915 to 1925 — the first successful attempt to deal with a plant disease by this means in Australia. The next disease to be successfully eradicated from New South Wales was boil smut of maize (Ustilago maydis), and then followed the well known control of bunchy top of bananas. This disease has not yet been eradicated but eradication measures have resulted in the reduction of the annual incidence from 2·69 plants per acre in 1937 to 0·09 in 1952-53, and the law of diminishing returns is operating strongly. Cherry leaf spot (Coccomyces hiemalis) was first detected in Australia in a nursery near Sydney in 1949-50. An eradication campaign was put into effect immediately and in all about 12,000 trees and stocks were destroyed. No sign of the disease has been seen since and it is hoped the disease has been eradicated. Apple scab (Venturia inaequalis) was detected in Western Australia in 1930 and penetrated deeply into the territory. After a prolonged fight eradication appears to have been successfully accomplished and no outbreaks of scab have been found during the past five seasons.

Dr. Chamberlain described the elimination of the barley smuts (Ustilago hordei and U. tritici) from New Zealand and the eradication of onion yellow dwarf from the Marshland area of the country, where the disease has not been observed since 1940. These instances must suffice for the purpose of this article, but they are not alone.

These striking results are what some plant pathologists have been looking for ever since the eradication of citrus canker from South Africa. During the last years of that epic struggle at least one distinguished South African plant pathologist questioned whether citrus canker would every be really eradicated from the Union. We have similar views expressed today and the Australian plant pathologists have shown how ill-founded such fears can be. No one imagines that every

(Continued on p. 16)

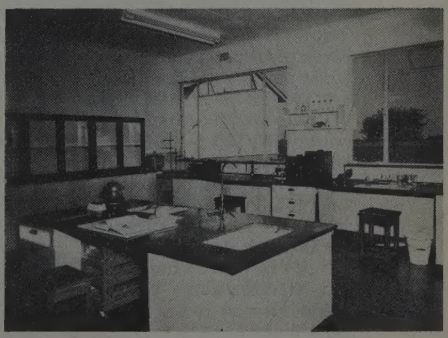
A neat field laboratory at Mt. Makulu, N. Rhodesia

E.A. Riley has sent particulars and the accompanying photographs (by the N.R. Information Dept.) of a new field laboratory recently erected at Mt. Makulu Research Station, N. Rhodesia. It is constructed of brick with asbestos-cement roof and a good design of steel frame window. A Crittal sectional glasshouse with slatted roller blinds, and a potting shed are erected close by.

The interior fittings are of the usual Rhodesian pattern made from local wood and three-ply, with porcelain sinks and running water. There is ample cupboard space for books, apparatus, and chemicals, and fluorescent lighting has also been installed. The laboratory is equipped with the usual sterilising apparatus and also refrigeration.

The rooms comprise a main laboratory, with three working places, approximately 21' × 20', an office 14' × 13', a tiled transfer room 9' × 8', and a preparation room 11' 8" × 8'.

N. elevation of new laboratory. The construction is essentially simple.



Interior of main laboratory with working space for three.

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plant disease can be eliminated by eradication measures but the measure of success achieved demonstrates that they are more frequently feasible than hitherto suspected.

In the past an excessive reliance on breeding disease-resistant varieties has often relegated the need for phytopathological investigation to the background. Even plant pathologists themselves have stated that the only thing to do against plant diseases in the Tropics is to breed against them. Very often this is the case but the time has come when the possibility of control by eradicative measures merits consideration. Moreover disease resistance may sometimes break down, for while the plant breeder can breed against disease the pathogen may breed more virulent strains. The appearance of the virulent race 15B of Puccinia graminis tritici is a case in point. Resistant varieties are often deficient in other qualities and would not be tolerated but for their resistance. The better control is to get rid of the pathogen altogether, for this eliminates the possibility of new virulent strains and permits the growing of desirable but susceptible varieties.

In view of the importance of the subject it has been thought worth while to give the interesting contributions and discussions at the Conference in full. The Report is now in the Press and is expected to be on sale in January, price 15s. post free.

S.P.W.